City of Novato

General Plan 2035 Policy White Paper

CLIMATE CHANGE ACTION PLAN

March 2015

The Issue

Whether new programs should be added to the City of Novato's 2009 Climate Change Action Plan. Also, whether to modify the 2009 Climate Change Action Plan to enable the City to streamline CEQA analysis of greenhouse gas emissions for future development projects.

White Paper Purpose

The General Plan white papers are intended to inform and elicit discussions regarding key policy issues relevant to updating the 1996 Novato General Plan. The policy direction provided through the white paper process is considered to be preliminary and will be used by staff when crafting policies and programs for the draft General Plan. All draft policies and programs will be reconsidered upon review of the draft General Plan and its accompanying environmental impact report (EIR).

Background

State Climate Policy

Since 2005, the State of California has responded to growing concerns over the effects of climate change by adopting a comprehensive approach to addressing greenhouse gas (GHG) emissions in the public and private sectors. Executive Order S-3-05, signed by Governor Arnold Schwarzenegger in 2005, established long-term targets to reduce GHG emissions to 1990 levels by 2020 and 80% below 1990 levels by 2050. The 2020 GHG reduction target was subsequently codified with the passage of the Global Warming Solutions Act of 2006, more commonly known as AB 32.

The California Air Resources Board (CARB) is responsible for monitoring and reducing greenhouse gas (GHG) emissions set forth in AB 32, and is, therefore, coordinating statewide efforts. In December 2008, CARB adopted a Scoping Plan that outlines the actions required for California to reach its 2020 emission target. The actions include a broad set of programs, including higher fuel-efficiency standards for light trucks and passenger vehicles, mandates for generation of electricity from renewable sources, higher energy efficiency standards for new buildings, and incentives for solar energy installation. These programs are detailed later in this white paper.

The Scoping Plan encourages local governments to adopt a reduction goal for municipal operations emissions and move toward establishing similar goals for community emissions that parallel the State commitment to reduce greenhouse gas emissions by 15% from "current" levels by 2020. The State encourages, but does not require, local governments to track GHG emissions and adopt a Climate Action Plan that identifies how the local community will meet the reduction target.

SB 375, passed by the State Assembly and Senate in August 2008, is another significant component of California's commitment to GHG reduction. The goal of SB 375 is to reduce emissions from cars and light trucks by promoting compact mixed-use, commercial and residential development. The first step outlined in SB 375 called for the state's 18 metropolitan planning organizations (MPOs) and the California Air Quality Board to establish a region's GHG reduction target for passenger vehicle and light duty truck emissions. Then, the MPO was required to develop a sustainable communities strategy that demonstrates how the region will meet its GHG reduction target. Here in the Bay Area, four regional government agencies – the Association of Bay Area Governments, the Bay Area Air Quality Management District, the Bay Conservation and Development Commission, and the Metropolitan Transportation Commission, worked together to create Plan Bay Area, the region's sustainable communities strategy. Adopted in July 2013, the plan is projected to reduce regional greenhouse gas emissions from passenger vehicles and light duty trucks 10.3% by 2020 and 16.4% by 2035.[1]

In 2010, the California State Office of Planning and Research adopted revised CEQA Guidelines which allow the City to streamline project-level analysis of greenhouse gas emissions through compliance with a greenhouse gas reduction plan contained in a general plan, long range development plan, or separate climate action plan. Plans must meet the criteria set forth in section 15183.5 of the CEQA Guidelines, which include requirements for quantifying existing and projected greenhouse gases; identifying a level of cumulative greenhouse gas emissions that would not be considered significant; specifying measures and standards that would ensure achievement of this level; and continued monitoring to track progress. The greenhouse gas reduction plan, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects such as development or infrastructure projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project.

Novato's 2009 Climate Change Action Plan

The purpose of a Climate Action Plan is to compile existing and potential strategies that a local government and the community at large can take to address climate change. A Climate Action Plan typically contains these elements:

- A community-wide greenhouse gas emissions inventory and a "business-as-usual" forecast of future emissions.
- A greenhouse gas reduction target consistent with AB 32.
- Local and state policies and actions that may impact greenhouse gas emissions within the city or town.
- Quantification of greenhouse gas reduction measures demonstrating that, if fully implemented, the greenhouse gas reduction target will be met.

[1] Association of Bay Area Governments and Metropolitan Transportation Commission, Draft Plan Bay Area Draft Environmental Impact Report, April 2013, pages 2.5-50 and 3.1.59.

The City of Novato adopted the Novato Climate Change Action Plan (CCAP) in 2009. The plan outlines strategies to achieve a greenhouse gas reduction target of 15% below 2005 emission levels by the year 2020, consistent with the State's direction to local governments. The 2009 CCAP also suggests a 2035 goal of 40% below 2005 levels to achieve the 80% statewide reduction by 2050 called for in Executive Order S-3-05.

Updating the 2009 Climate Action Plan

Greenhouse Gas Emissions Inventory

The 2009 CCAP utilizes the Novato 2005 Greenhouse Gas Inventory in establishing baseline emissions for both municipal operations and the community at large. In 2013, the Marin Climate & Energy Partnership (MCEP) prepared a GHG Inventory for 2010 community and local government operations emissions. Due to refinements in available data, emission factors, and calculation methodologies, MCEP found it necessary to revise the 2005 inventory. In addition, MCEP inventoried emissions from three new sectors – Off-Road Vehicle & Equipment, Water, and Wastewater – in order to conform to the Bay Area Air Quality Management District (BAAQMD) GHG Plan Level Guidance, issued in November 2011. The table below compares the 2005 baseline emissions contained in the City's CCAP, and the baseline emissions that were recalculated for the 2010 inventory.

2005 Baseline Emissions

Sector	2009 CCAP	Revised
Residential	85,418	84,317
Commercial/Industrial	56,952	57,196
Transportation	313,160	131,019
Waste	10,361	11,490
Off-Road Vehicles & Equipment	n/a	4,179
Water	n/a	2,151
Wastewater	n/a	6,145
TOTAL	**465,892**	**296,318**

The greatest difference is in the Transportation sector. This is primarily due to a change in the calculation of state highway vehicle miles travelled (VMT) for Novato. Previously, VMT was calculated by allocating all state highway VMT that occurred within Novato's city limits to the City. The new methodology, which relies on BAAQMD's Plan Level Guidance, allocates a portion of county-wide state highway VMT to Novato, based on the percentage the city contributes to overall county-wide VMT.

"Business-as-Usual" Forecasts

The 2009 CCAP includes a business-as-usual forecast, in which emissions are projected in the absence of any policies or actions that would occur beyond the base year to reduce emissions. The forecasts are derived by "growing" baseline emissions by forecasted changes in population, number of households, and jobs according to projections developed by the Association of Bay Area Governments. Transportation emissions are projected utilizing data provided by the

Metropolitan Transportation Commission (MTC). The tables below show the forecast that was developed for the CCAP and an updated forecast utilizing more current sources. The revised forecast uses projections from ABAG's Plan Bay Area Projections 2013. VMT is projected utilizing current data provided by the MTC and includes estimated VMT reductions from implementation of Plan Bay Area.

2009 CCAP "Business-as-Usual" Forecast

Sector	2005	2020
Residential	85,418	91,845
Commercial/Industrial	56,952	59,763
Transportation	313,160	350,153
Waste	10,361	11,097
Off-Road Vehicles & Equipment	n/a	n/a
Water	n/a	n/a
Wastewater	n/a	n/a
Total	**465,892**	**512,858**
Increase from 2005		**10.0%**

Updated "Business-as-Usual" Forecast

Sector	2005	2010	2020
Residential	84,317	83,908	85,563
Commercial/Industrial	57,196	58,971	64,100
Transportation	131,019	125,859	126,339
Waste	11,490	5,558	7,929
Off-Road Vehicles & Equip.	4,179	3,683	3,775
Water	2,151	1,930	1,978
Wastewater	6,145	5,558	5,697
Total	**296,318**	**287,645**	**295,381**
Increase/(Decrease) from 2005 Levels		**(2.9%)**	**(0.3%)**

One important difference is that the updated forecast is projected from year 2010 emissions levels, rather than 2005. This results in a more accurate forecast and gives the City credit for the 2.9% reduction in community emissions that occurred between 2005 and 2010.

Reductions from State Actions

The business-as-usual forecast is adjusted by State actions that have been approved, programmed, and/or adopted. These include the following programs:

Renewable Portfolio Standard (RPS)

Established in 2002 in Senate Bill 1078, the Renewable Portfolio Standard program requires electricity providers to increase the portion of energy that comes from eligible renewable sources, including solar, wind, small hydroelectric, geothermal, biomass and biowaste, to 20% by 2010 and to 33% by 2020. In 2012, PG&E's electric power generation mix contained 19% renewable energy. Marin Clean Energy's Light Green electricity contained 53% renewable energy; the Deep Green product contained 100% renewable energy.

Pavley (AB 1493)

Assembly Bill 1493 (Pavley), signed into law in 2002, requires carmakers to reduce greenhouse gas emissions from new passenger cars and light trucks beginning in 2009 through increased fuel efficiency standards. The California Air Resources Board (CARB) adopted regulations in September 2009 that reduce greenhouse gas emissions in new passenger cars, pickup trucks and sport utility vehicles for model years 2012-2016. CARB expects the new standards to reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016, while improving fuel efficiency and reducing motorists' costs.

Low Carbon Fuel Standard

The State is also working to reduce the carbon intensity of transportation fuels consumed in California. To achieve this, CARB has developed a Low Carbon Fuel Standard (LCFS), which will reduce the carbon intensity of California's transportation fuels by at least 10% by 2020 as called for by Governor Schwarzenegger in Executive Order S-01-07. LCFS uses a market-based cap and trade approach to lowering the greenhouse gas emissions from petroleum-based transportation fuels like reformulated gasoline and diesel. Petroleum importers, refiners and wholesalers can either develop their own low carbon fuel products or buy LCFS credits from other companies that develop and sell low carbon alternative fuels, such as biofuels, electricity, natural gas or hydrogen.

Advanced Clean Cars

The Advanced Clean Cars rule will further reduce GHG emissions from automobiles and light-duty trucks for 2017-2025 vehicle models years. The ARB estimates that implementation of the ACC rule will reduce statewide emissions from light-duty vehicles by 3.8 million MTCO2e in 2020, or by approximately 2.5%.

AB 32 Vehicle Efficiency Measures

The AB 32 scoping plan includes several vehicle efficiency measures that focus on maintenance practices. The Tire Pressure Program will increase vehicle efficiency by assuring properly inflated automobile tires to reduce rolling resistance. The Heavy-Duty Vehicle Aerodynamic Efficiency Program will increase heavy-duty (long-haul trucks) efficiency by requiring installation of best available technology and/or ARB approved technology to reduce aerodynamic drag and rolling resistance. Finally, the Heavy-Duty Vehicle Hybridization Program will reduce GHG emission through the use of hybrid and zero-emission technology.

Title 24

The California Energy Commission (CEC) promotes energy efficiency and conservation by setting the state's building efficiency standards. Title 24 of the California Code of Regulations consists of regulations that cover the structural, electrical, mechanical, and plumbing system of every building constructed or altered after 1978. The building energy efficiency standards are updated on an approximate three-year cycle, and each cycle imposes increasingly higher demands on energy efficiency and conservation. The CEC's 2007 Integrated Policy Report

established the goal that new building standards achieve "net zero energy" levels by 2020 for residences and by 2030 for commercial buildings. The California Public Utility Commission's California Long Term Energy Efficiency Strategic Plan, dated July 2008, endorses the Energy Commission's zero net energy goals for all newly constructed homes by 2020 and for all newly constructed commercial buildings by 2030.

Lighting Efficiency and Toxic Reduction Act

AB 1109, the Lighting Efficiency and Toxic Reduction Act, tasks the California Energy Commission (CEC) with reducing lighting energy usage in indoor residences by no less than 50% from 2007 levels by 2018, as well as requires a 25% reduction in indoor and outdoor commercial buildings by the same date. To achieve these efficiency levels, the CEC applies its existing appliance efficiency standards to include lighting products, as well as requires minimum lumen/watt standards for different categories of lighting products. The bill also expands existing incentives for energy efficient lighting.

Residential Solar Water Heaters

The Residential Solar Water heater Program (AB 1470) creates a $25 million per year, 10-year incentive program to encourage the installation of solar water heating systems that offset natural gas and electricity use in homes and businesses throughout the state. The goal is to install 200,000 solar water heaters by 2017.

California Solar Initiative

The California Solar Initiative (CSI) program is a solar rebate program for electric customers of the investor-owned utilities, including PG&E. The program funds solar installations on homes and commercial buildings and offers different incentive levels based on system capacity as well as the performance of the solar panels. Although the program was expected to run through 2016, program funds were exhausted in 2013, and the program is now closed. The program's goal was to install approximately 1,940 MW of new solar generation capacity. As of January 2015, California had installed 2,332 MW of solar projects (this figure includes non-CSI data).

As shown in the table below, projected emission reductions for these State actions total 65,668 metric tons CO_2e, which exceeds the City's 2020 target of 15% below 2005 levels.

Emission Reductions from State Actions

State Action	Emissions Reductions 2020
Renewable Portfolio Standard	27,046
Pavley and Low Carbon Fuel Standard	27,413
Advanced Clean Cars Rule	2,246
AB32 Vehicle Efficiency Measures	514
Title 24	538
Lighting Efficiency	7,184
Residential Solar Water Heaters	162
California Solar Initiative	565
Total	**65,668**
% Reduced Below 2005 Baseline	**22.5%**

Reductions from CCAP Measures

The CCAP contains 28 local mitigation measures to reduce greenhouse gas emissions through 2035. These are grouped around eight goals as follows:

- Energy Efficiency and Conservation. Reduce emissions from the energy sector through energy efficiency and conservation efforts within municipal and community operations.
- Renewable Energy. Reduce emissions associated with energy generation through promotion and support of renewable energy generation and use.
- Green Building and Design. Reduce emissions from the built environment through "green building" and urban design principles that minimize the urban heat island effect and reduce energy consumption.
- Water Conservation. Reduce emissions from water and wastewater sources by increasing water conservation.
- Vehicle Efficiency and Alternative Fuels. Reduce emissions from transportation sources by promoting use of alternative fuels and efficient use of traditional automobiles.
- Citywide Land Use and Design. Reduce emissions by decreasing Vehicle Miles Traveled (VMT) within the City through strategic land use and design.
- Alternative Transportation Modes. Reduce emissions from transportation sources through promotion of non-vehicular modes of travel.
- Waste. Reduce emissions from waste sources.

GHG reductions for the 28 mitigation measures identified in the CCAP were recalculated utilizing updated data. Some calculation methodologies were revised to reflect new guidance from the California Air Pollution Control Officers Association's "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," published August 2010. Other calculations were revised with new input from staff. The updated calculations are shown in the table on the following page.

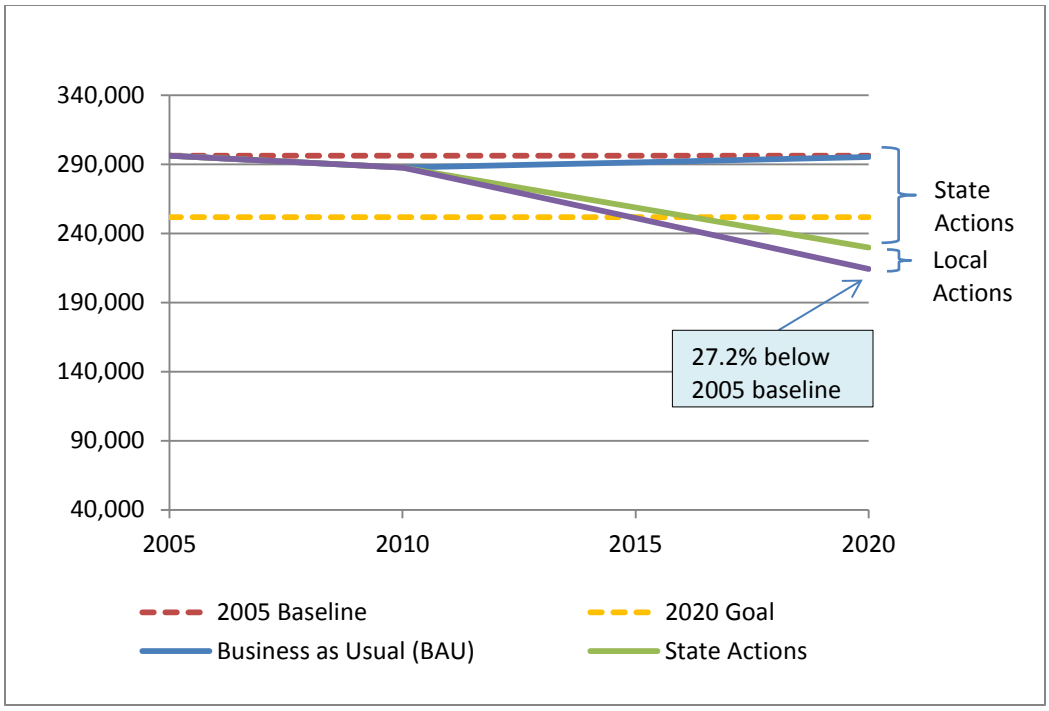
Emission Reductions from Local Mitigation Measures

Local Measures	Assumptions	Revised 2020 Reductions ($MTCO_2e$)	Percent of Total 2020 Reductions
1-Streetlights	Replace all 3,126 streetlights with LED lamps.	118	0.8%
2-Municipal Energy Audit	Reduce building energy use by 30% through HVAC, lighting and mechanical equipment upgrades and installing a programmable thermostat and upgrading windows the Police Department.	159	1.1%
3-Energy Efficiency Protocols	Reduce energy use 15% through energy management software and behavioral changes.	64	0.5%
4-Low Income Households Program	Target 1,200 homes by 2020 and 3,000 homes by 2035 for energy efficiency programs.	428	3.1%
5-Public Outreach	1% of people will reduce energy use by 10%.	124	0.9%
6-Municipal Renewable Energy	Existing solar panels at Margaret Todd Senior Center/Hill Road Gym, Corporate Yard and Gymnastics Center zero out electricity consumption at these facilities. Proposed Hamilton Pool system is built by 2020. Additional system, similar to Corporate Yard site studied for the SEED Fund in 2013, is completed by 2035.	16	0.1%
7-Community Renewable Energy	8% of community electricity is generated by solar systems by 2020; 25% by 2035.	3,604	26.2%
8-Green Building Standards	Require 15% energy savings above California Title 24 energy standards.	399	2.9%
9-Cool Paving	15% of City's paved areas use high albedo material by 2020; 30% by 2035.	335	2.4%
10-Tree Cover	500 net new trees planted each year.	157	1.1%
11-Water Conservation	Reduce water use 20% by 2020 and 28% by 2035.	495	3.6%
12-Municipal Water Conservation	Reduce municipal water use 20% by 2020 and 30% by 2035.	<1	<0.1%
13-Vehicle Idling	Synchronize traffic signals and reduce heavy-duty truck idling.	1,602	11.5%
14-Trip Reduction	Achieve employee rideshare participant rates of 12% in 2020 and 15% in 2035.	698	5.0%
15-Low Emission Vehicles	300 EV charging spaces by 2020 and 600 EV charging spaces by 2035.	405	2.9%
16-City Low Emission Vehicles	City replaces existing vehicles with 15 hybrid and 5 electric vehicles by 2020; 30 hybrid and 10 electric vehicles by 2035.	246	2.9%
17-Mixed Use, Infill Development	New development in mixed-use, infill projects.	211	1.8%

18-Jobs/Housing Balance	Improve jobs/housing balance by attracting higher paying jobs for those who live, or are likely to live, in Novato.	1,786	12.9%
19-Affordable Housing	10% of new housing units are below market rate units.	7	0.1%
20-Pedestrian Connections	Promote walking though design standards and pedestrian amenities.	13	0.1%
21-Commercial Bicycle Parking	Increase bicycle parking requirements for commercial buildings and continue to require bike facilities.	1	<0.1%
22-Residential Bicycle Parking	Increase bicycle parking requirements for multi-family buildings and continue to require bike facilities.	1	<0.1%
23-Complete Streets	Increase bike commuting 23% by 2020 and 48% by 2035.	60	0.4%
24-Parking Standards	Reduce VMT attributed to new development 10%.	23	0.2%
25-Transit Improvements	Increase frequency of bus service 30% by 2020 and 50% by 2035.	284	2.0%
26-Safe Routes to School	Reduce VMT generated by student commutes 15%.	2	<0.1%
27-Municipal Travel	Reduce VMT generated by city employee commutes 20%.	101	0.7%
28-Zero Waste	Increase organic waste diversion rate (58% in 2013) to achieve 70% diversion of organic material (food, paper, yard, etc.) in 2020.	2,523	18.2%
Total Reductions		**13,898**	
% Change from 2005 Levels		**4.7%**	

Summary

The chart below depicts projected emissions for 2020 under a BAU scenario and with State and local measures implemented. State measures are estimated to reduce emissions 22.5% below 2005 levels by 2020. State and local actions combined would reduce emissions 27.2% below 2005 levels by 2020. These reductions are sufficient to meet the 2020 goal.



Potential New Mitigation Measures

Staff has identified several new measures that could be added to the local mitigation measures identified in the CCAP. These are:

1. Commercial Energy Efficiency

Smart Lights is a Marin Energy Watch program designed to help small businesses become more energy-efficient. The program offers free start-to-finish technical assistance and instant rebates to help defray the cost of upgrading and/or repairing existing equipment. Smart Lights can help with comprehensive lighting retrofits, refrigeration tune-ups, controls, and seals replacement, replacing domestic hot water heaters, and referrals to appropriate HVAC programs. Between 2009 and 2011, Smart Lights completed 144 projects in Novato that save 1,057,522 kWh annually. Based on the success of Marin Energy Watch's SmartLights program, staff assumes 480 projects will be completed by 2020. The City can assist in promoting the Energy Watch program to the local business community.

2. Resale Energy Efficiency Requirements

This program would require homeowners to complete an energy audit prior to resale and complete a set of minimal energy efficiency upgrades either prior to resale or within a specified period of time after resale. The goal of the program would be to reduce electricity use 10% and natural gas 5%. Staff calculated emission reductions by assuming 807 resales per year, based on Marin County Assessor data. A basic single family retrofit that includes replacing interior high use incandescent lamps with LEDs and sealing air ducts is estimated to cost between $880 and $1,900 (U.S. Department of Energy).

3. Municipal Deep Green Electricity

This program would require the City to purchase Marin Clean Energy Deep Green 100% renewable electricity for all City facilities. Staff assumed all energy efficiency and renewable energy measures would be implemented first (Measures 1, 2, 3, 6, 12 and 16). Deep Green electricity currently costs 1 cent per kWh. At this rate, the annual cost is estimated to be $14,800 in 2020 (in 2014 dollars). Currently, the City would need to spend approximately $26,000 annually to offset all electricity consumption for City facilities.

4. Community Deep Green

Approximately 1.8% of Marin Clean Energy's customers chose Deep Green 100% renewable electricity in 2013. There were 141 Deep Green accounts (residential and commercial) in Novato in 2013. This program would encourage homeowners to choose Deep Green electricity and assumes 1,000 households will participate in 2020 (4.8% of all households). At current rates, Deep Green would cost the average household $66 per year.

Potential Additional Local Mitigation Measures

Local Measures	Revised 2020 Reductions ($MTCO_2e$)
1-Commercial Energy Efficiency Programs	463
2-Resale Energy Efficiency Requirements	910
3-Municipal Deep Green Electricity	195
4-Community Deep Green Electricity	866
Total Reductions	**2,434**
% Change from 2005 Levels	**1.2%**

Implementing these policy options would increase total GHG reductions to 28.5% below 2005 levels by 2020.

Tiering and Streamlining the Analysis of Greenhouse Gas Emissions in CEQA Review

Since adoption of the revised CEQA guidelines in 2010, BAAQMD has been reviewing draft greenhouse gas reduction plans to determine if these plans meet the State's criteria for GHG reduction strategies that support tiering. While it is ultimately up to the lead agency to make such an assertion and support it with substantial evidence, BAAQMD provides guidance as to what Air District staff must see in draft plans in order for the District to consider writing a letter opining that a draft climate action plan meets the criteria established by the State. In order to ensure greenhouse gas reductions will be achieved, plans should rely on mandatory measures

that are actionable by the City. BAAQMD recommends annual reporting on the implementation of the measures and periodic inventorying of greenhouse gas emissions.

Concurrent with the General Plan Update process, there is an opportunity to update the City's Climate Change Action Plan to conform to the requirements of CEQA section 15183.5. BAAQMD staff has already reviewed the City's 2009 Plan and revised calculations, and as a result planning staff believes an updated Plan will ultimately meet BAAQMD's recommendations with some further modifications.

Due to the time-consuming and costly nature of developing and implementing a greenhouse gas reduction plan for CEQA tiering purposes, these plans are most often adopted by large cities that anticipate and want to facilitate significant new development. In Marin County, the City of San Rafael has such a plan, and the County has drafted their Climate Action Plan to meet the same objective. Staff estimates it will cost approximately $5,000 per year for a consultant to prepare a community-wide greenhouse gas inventory; these funds could be collected through development impact fees. In addition, there would be increased demands upon staff to implement and monitor CCAP programs. Ideally, the City would fund a part-time position to implement the CCAP measures, provide community education and marketing, monitor legislation and grants, and collect data for progress reports.

Climate Change Action Plan Policy Options

1. **Add a program to support commercial energy efficiency upgrade programs.**
2. **Add a program to require an energy efficiency audit and upgrades at time of residential resale.**
3. **Add a program to require the City to purchase Marin Clean Energy Deep Green electricity for all facilities.**
4. **Add a program to encourage homeowners to switch to Marin Clean Energy Deep Green electricity.**
5. **Update the Climate Change Action Plan to conform to the requirements of CEQA Section 15183.5.**

Analysis of Climate Change Action Plan Policy Options

1. **Add a program to support commercial energy efficiency upgrade programs.**

   Pros

   a. Allows the City to take credit for electricity reductions due to an ongoing and proven program.

Cons

a. None

2. Add a program to require an energy efficiency audit and upgrades at time of residential resale.

Pros

a. Would significantly reduce community emissions, although not to the extent necessary to meet the 2035 goal.
b. Would improve the energy efficiency of the existing housing stock and reduce homeowner's energy costs.

Cons

a. Increased cost to homeowner for audit and required upgrades.
b. Increased cost to City to implement program and inspect dwellings for compliance.

3. Add a program to require the City to purchase Marin Clean Energy Deep Green electricity for all facilities.

Pros

a. Would significantly reduce emissions from government operations.

Cons

a. Increased cost to the City.

4. Add a program to encourage homeowners to switch to Marin Clean Energy Deep Green electricity.

Pros

a. Would reduce community emissions, although not to the extent needed to meet the 2035 target.

Cons

a. Increased cost to homeowners.

6. Update the Climate Change Action Plan to conform to the requirements of CEQA section 15183.5.

Pros

a. Allows the City to streamline development and infrastructure projects that would otherwise require greenhouse gas analysis and mitigation measures.

Cons

a. Increased cost to the City to pursue BAAQMD approval, which may require new or revised programs and re-quantification of mitigation measures.
b. Increased cost to the City to develop a project application checklist and implement checklist requirements during project review.

c. Increased cost to the City to annually quantify community greenhouse gas emissions and track and report progress in meeting CCAP program goals to BAAQMD.
d. Limited projected development means the City would be providing this benefit for relatively few projects.

Appendices

A. Program Description and GHG Reduction Calculations for Local Measures

B. 2012 California Environmental Quality Act (CEQA) Statue and Guidelines §15183.5

APPENDIX A

Program Description and GHG Reduction Calculations for Local Measures

STREETLIGHTS

Reduction Measure 1

Objective	Work with the Marin General Services Authority to complete replacement of incandescent and mercury vapor street, parking lot and other municipal outdoor lights with LED or other energy-efficient alternatives.
Reductions ($MTCO_2e$) -117.8	2020: Replace 3,126 streetlights with LED lamps.
Methodology	The method used to calculate energy savings was developed by City staff and PG&E in completing the City's Energy Efficiency and conservation Block Grant application. Since 2010, the City has upgraded approximately 43% of its streetlights.
Sources	Novato Climate Change Action Plan 2009.

Calculation

	2020
Number of streetlights	3,126
Reduction in annual energy use (kWh)	895,809
Reduction in electricity emissions ($MTCO_2e$)	117.77

MUNICIPAL ENERGY AUDIT AND RETROFITS

Reduction Measure 2

Objective	Reduce building energy use by 30% through increased energy efficiency and conservation.
Reductions ($MTCO_2e$) -158.7	Implementation action: 2020: Reduce building energy use by 30%
Methodology	This measure requires the City to continue working with the Marin Energy Management Team and other organizations to reduce building energy use by 30% through increased energy efficiency and conservation. Since 2010, the City of Novato has upgraded lights at the Lu Sutton Daycare facility in 2013, saving approximately 3,000 kWh per year. Projects identified in the audit, but not yet completed, include: a. Light Strings downtown – approximately 20,869 kWh b. Police Station HVAC and lighting upgrades – approximately 82,200 kWh Additional energy efficiency savings can most likely be achieved through upgrades to mechanical equipment; installing a programmable thermostat and upgrading windows at the Police Department.
Sources	Novato Climate Change Action Plan 2009 City of Novato Green Business Certification Report, 2014 Dana Armanino, Sustainability Planner, County of Marin

Calculation

	2020
Electricity use in municipal buildings	1,116,108
Natural gas use in municipal buildings	71,915
Percent reduction in energy use	30%
Annual natural gas savings (therms)	21,575
Annual electricity savings (kWh)	334,832
GHG emissions reductions	158.7

ENERGY EFFICIENCY PROTOCOLS

Reduction Measure 3

Objective	Establish energy efficiency protocols to reduce energy consumption through behavior and operational changes.
Program Description from 2009 CCAP	This is the first part of a multi-tiered approach to reduce energy consumption and associated GHG emissions in municipal facilities through the implementation of energy efficiency protocols to reduce the energy demands of City buildings and facilities. This includes 1) establishing energy efficiency protocols for building custodial and cleaning services and other employees, including efficient use of facilities, such as turning of lights and computers, thermostat use, etc., 2) incorporating energy management software, electricity monitors, or other methods to monitor energy use in municipal buildings, and 3) implementing off-peak scheduling of pumps, motors and other energy intensive machinery where feasible.
Reductions ($MTCO_2e$) -64.1	2020
Methodology	The 2014 Green Business Certification Report for the City of Novato identified potential Energy Star Comuter Power Management Savings as follows: Municipal Offices: 102,588 kWh Police Department: 79,998 kWh Energy management software is proven to reduce energy consumption by 10% through identifying inefficiencies within operations. An additional 5% reduction in energy use for miscellanous behavioral changes by staff and mechanical operations was assumed. Reductions to electricty use were made from municipal energy consumption data, assuming that all recommended retrofits were completed (Measure 2) by 2020. See Novato Climate Change Action Plan 2009.
Sources	Novato Climate Change Action Plan 2009 City of Novato Green Business Certification Report, 2014

Calculation

	2020
Electricity use in municipal buildings after Measure 2	781,276
Natural gas use in municipal buildings after Measure 2	50,341
Percent reduction in energy use	15%
Annual natural gas savings (therms)	7,551
Annual electricity savings (kWh)	182,586
GHG emissions reductions	64.1

RESIDENTIAL ENERGY EFFICIENCY PROGRAMS

Reduction Measure 4

Objective	Continue and expand residential energy efficiency programs such as California Energy Youth Services and Energy Upgrade California.
Reductions ($MTCO_2e$) -428.1	2020
Methodology	This measure was orignally titled "Low-Income Households Programs" and the original objective was "Expand and better integrate programs for low-income households such as distribution of CFL lights and water-conserving showerheads." The measure's objective has been expanded to apply to all households and to reflect current programs and data as follows: California Youth Energy Services (CYES) provides no-cost green house calls to homeowners and renters, regardless of income level. The professionally-trained staff provides energy assessments and installs free energy and water-saving equipment. CYES serves single family dwellings, 2-4 duplexes, and multi-family units. Between 2009 and 2011, CYES served 340 households in Novato and installed energy-efficient equipment that saves 204,247 kWh hours of electricity annually, or an average of 600 kWh/household. Between 2006-2013, the program served an average of 120 households. Energy Upgrade California is an energy efficiency program that provides rebates and resources to upgrade single family and 2-4 unit multi-family dwellings to save energy and water. Between June 2010 and May 2012, three homes in Novato participated in the program, improving their homes' energy efficiency by an average of 31 percent.
Sources	Dana Armanino, Marin Energy Watch Partnership

Calculation

	2020
Households served	1,200
Electricity savings per household (kWh)	600
Annual electricity savings (kWh)	720,000
Natural gas savings per household (10%)	52.3
Annual natural gas savings (therms)	62,722
GHG emissions reductions	428.1

PUBLIC OUTREACH

Reduction Measure 5

Objective	Promote residential and commercial energy efficiency and conservation through energy bill inserts, public services announcements, recognition programs, and other forms of public outreach.
Program Description from 2009 CCAP	This measure directs the implementation of a communitywide public outreach and education campaign to inform residents, businesses, and consumers about the way that individuals can reduce their energy costs and GHG emissions. This includes informing the public about the benefits of installing energy efficient indoor and outdoor lighting and alerting them to the availability of free energy audit programs, financial, and other incentives that area available to assist residential and commercial energy audits and retrofits.
Reductions ($MTCO_2e$) -124.0	2020
Methodology	For the City's public education campaign, it was assumed that approximately 1% of people would reduce their emissions from electricity and natural gas consumption in all sectors by about 10%. See Novato Climate Change Action Plan 2009.
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Population	53,200
Community electricity consumption (kWh)	334,735,842
Reduction in electricity (kWh)	0.10%
Annual electricity savings (kWh)	325,017
Community natural gas consumption (therms)	15,297,900
Reduction in natural gas (therms)	0.10%
Annual natural gas savings (therms)	15,298
GHG emissions reductions	124.0

MUNICIPAL RENEWABLE ENERGY

Reduction Measure 6

Objective	Install cost-effective renewable energy systems on all buildings and facilities.
Reductions ($MTCO_2e$) -16.5	2020
Methodology	This measure's original description includes an objective to "purchase remaining electricity from renewable sources." This has been separated from the measure and is now contianed in a new measure 31. Reductions for 2020 were revised to reflect identified projects as follows: Three solar systems were installed in 2010 at the Margaret Todd Senior Center/Hill Road Gym, the Corporate Yard, and the Gymnastics Center on 7th St. These facilities had the following electricity usage in 2010: Margaret Todd Senior Center/Hill Road gym, 120,640 kWh; Corporate Yard, 27,120 kWh; Gymnastic Center, 6,480 kWh. The three sites totaled 154,240 kWh in 2010. Electricity usage for 2013: Margaret Todd Senior Center/Hill Road gym, 40,800 kWh; Corporate Yard, 44,619 kWh; Gymnastic Center, 14,097 kWh. The three sites totaled 99,516 kWh in 2013. As a result, an additional 54,724 kWh savings is attributed to this measure. Three PV sites were analyzed for the SEED Fund Solar Program in 2013: Hamilton Pool, the Corporation Yard and Lynwood Hill Park. The Hamilton Pool site was subsequently determined to be the only viable site. The system for this site is estimated to produce 70,406 kWh annually, and is assumed to be the only additional PV project built by 2020.
Sources	Solar Feasibility Study for the City of Novato, September 23, 2013, prepared by Optony, Inc.

Calculation

	2020
Additonal kWh generated by 2010 installations	54,724
kWh generated by Hamilton Pool installation	70,406
Total kWh generated by solar energy systems	125,130
GHG emissions reductions	16.5

COMMUNITY RENEWABLE ENERGY FACILITATION

Reduction Measure 7

Objective	Identify and remove barriers to small-scale, distributed renewable energy production within the community.
Program Description from 2009 CCAP	The goal of this measure is to reduce GHG emissions from residential and commercial energy use by facilitating the development of small-scale distributed renewable energy production. This can be accomplished through 1) adoption of incentives, such as permit streamlining and fee waivers, as feasible; 2) amendments to development codes, design guidelines, and zoning ordinances, as necessary; 3) installation of solar panels on carports and over parking areas on municipal facilities, commercial projects, and new large-scale residential developments, and; 4) implementation of AB 811 programs for small and large projects.
Reductions ($MTCO_2e$) -3,639.6	2020
Methodology	kWh from Renewable Energy Facilities: Calculation assumes 10% of community electricity will be generated by PV in 2020 based on historic trends (31% year over year growth in the PV market). The projected amount of energy use excludes the percentage of energy use attributed to municipal facilities that is accounted for in Measure 6. The estimate of PV installed is restricted to installations on existing homes and commercial properties. It excludes renewable installations to power new developments that come as a result of green building efforts or the zero net energy homes effort. It also excludes solar systems installed as a result of the CSI program, which is quantifed separately as a State action.
Sources	Novato Climate Change Action Plan 2009 Installed solar data from Dana Armanino, Sustainability Planner, County of Marin Electricity production estimates from Jonathan Whelan, Senior Project Manager, Optony, Inc.

Calculation

	2020
Community electricity consumption (kWh), excluding new development	307,273,330
Less government operations kWh	304,253,097
Percent kWh generated by renewable systems	10%
kWh produced by renewable systems	30,425,310
Less electricity savings generated by CSI program (kWh)	2,741,945
Net annual electricity savings (kWh)	27,683,365
GHG emissions reductions	3,639.6

GREEN BUILDING STANDARDS

Reduction Measure 8

Objective	Continue to implement the City's Green Building Program. Expand program to require a minimum of 15% above California Title 24 energy standards, as amended.
Reductions ($MTCO_2e$) -399.4	Implementation action: 2020
Methodology	CAPCOA Measure BE-1 used for estimating building energy savings. For remodels and additions, assumed an average of 4 residential projects per year (approximately 1,600 square feet of conditioned space total) and 5 non-residential projects per year(approximately 40,000 square feet of remodeled area total). Assumed 1,800 square feet per residential building (2011 American Housing Survey for owner-occupied units in San Francisco-San Mateo-Redwood City AHS Area). For commercial buildings, assumed 15.3 kWh per square foot and 0.32 therms per square foot.
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Robert Cubley, Interim Building Official, City of Novato 2011 American Housing Survey, Table C-02-OO-M U.S. Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-871A, C, and E of the 2003 Commercial Buildings Energy Consumption Survey (Zone 4).

Calculation

Residential: New Construction	**2020**
Percent over Title 24 Energy Requirements	15 %
Percent of participating new residential units	100%
New construction electricity use, BAU	1,692,310 kWh
New construction electricity use, after Title 24	1,285,222 kWh
Additional reduction in electricity use	13,495 kWh
New construction natural gas use, BAU	134,330 therms
New construction natural gas use, after Title 24	121,645 therms
Additional reduction in natural gas use	16,276 therms
GHG emissions reductions	88.3 $MTCO_2e$

Residential: Remodels and Additions	**2020**
Percent over Title 24 Energy Requirements	15 %
Number of projects per year	4

Residential: Remodels and Additions	2020
Percent over Title 24 Energy Requirements	15 %
Number of projects per year	4
Annual remodeled/expanded space per year	1,600 square feet
Total remodeled/expanded space, 2015-2020	8,000 square feet
Electricity use, BAU	29,266 kWh
Reduction in electricity use	176 KWh
Natural gas use, BAU	2,323 therms
Reduction in natural gas use	311 therms
GHG emissions reductions	1.7 $MTCO_2e$

Commercial	2020
Percent over Title 24 Energy Requirements	15 %
Percent of participating new commercial space	100%
New construction electricity use, BAU	15,109,537 kWh
New construction electricity use, after Title 24	14,258,115 kWh
Additional reduction in electricity use	556,066 kWh
New construction natural gas use, BAU	359,185 therms
New construction natural gas use, after Title 24	320,357 therms
Additional reduction in natural gas use	34,599 therms
GHG emissions reductions	257.0 MTCO2e

Commercial: Remodels and Additions	2020
Percent over Title 24 Energy Requirements	15 %
Number of projects per year	5
Total remodeled/expanded space, 2015-2020	200,000 square feet
Electricity use, BAU	3,060,000 kWh
Reduction in electricity use	119,340 KWh
Natural gas use, BAU	64,000 therms
Reduction in natural gas use	6,912 therms
GHG emissions reductions	52.4 $MTCO_2e$

COOL PAVING MATERIALS

Reduction Measure 9

Objective	Require the use of high "albedo" material for future outdoor surfaces such as parking lots, median barriers, roadway improvements, and sidewalks in order to reduce the urban heat island effect and save energy.
Reductions ($MTCO_2e$) -334.6	2020
Update	The City's current pavement rehabilitation strategy includes repaving approximately 5% of the public street network each year. PW staff is actively engaged in researching the latest pavement rehabilitation products and strategies to maximize the use of available funding. As part of this effort, the feasibility of incorporating high albedo products will be evaluated. Assuming a suitable product is found, a 15% goal could be achieved over a three year cycle of pavement rehabilitation projects. The 10,000 SF parking lot at the new City Administrative Offices building was finished with high albedo concrete pavers.
Methodology	On average, for metroplition areas studied, vegetation covers about 29-41% of the area, roofs 19-25%, and paved surfaces 29-39% (Akbari, 2008). For Novato, assumed paved surfaces cover 29%. Assume 15% will be replaced with high albedo content by 2020. Pavement has a potential for a 0.15 to 0.25 increase in albedo (Akbari, 2008); we have conservativley assumed a 0.15 change in albedo. 0.29 *0.15 * 0.15 = Net change of 0.006525. - a 10K decrease in temperature for a 0.25 increase in albedo (Akbari) - 10 Kelvin = 10 Celsius - Electricity demand in cities increases by 2–4% for each 1 degree Celsius increase. Assume 3% for Novato. See Novato Climate Change Action Plan 2009.
Sources	Novato Climate Change Action Plan 2009 Akabari, Hashem and Rose, Leanna Shea, "Urban Surfaces and Heat Island Mitigation Potentials," Journal of the Human-Environmental System, Vol. 11; No. 2: 85-101. 2008.

Calculation

	2020
Percent of city covered in pavement	29%
Percent of paved area with high albedo	15%
Albedo change	0.007
Temperature decrease (Celsius)	0.261
Reduction in electricity use (kWh)	2,544,882
Reduction in emissions	334.6

TREE COVER
Reduction Measure 10

Objective	Increase Tree Cover: Increase tree cover of structures and other improvements within the City through implementation of the City's Urban Forestry Plan, including updated landscaping requirements to ensure strategic placement of plantings to shade east and west walls of structures. Update parking lot standards to increase tree cover; consider prohibiting trees with high biogenic emissions.
Reductions ($MTCO_2e$) -156.7	2020: Plant 500 new trees per year.
Methodology	Sequestration: CAPCOA Measure V-1. Assumed default annual sequestration rate of .0354 MTCO2 accumulation per tree per year and an active growing period of 20 years. Thereafter, the accumulation of carbon in biomass slows with age, and will be completely offset by losses from clipping, pruning, and occasional death. Electricity savings: See Novato Climate Action Plan 2009
Sources	California Air Pollution Control Officers Association, "Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures," August, 2010. Novato Climate Change Action Plan 2009

Calculation

	2020
Annual sequestration rate per tree	0.0354 $MTCO_2$
Number of trees planted over period in active growing stage in inventory year	3,000
GHG emissions reduction from sequestration	106.2 $MTCO_2e$
Energy reduction per tree (kWh)	128 kWh
Annual electricity savings (kWh)	384,480 kWh
GHG emissions reduction from electricity savings	51 $MTCO_2e$
Total GHG emissions reductions	157 $MTCO_2e$

WATER CONSERVATION

Reduction Measure 11

Objective	Conserve water through improved efficiency.
Reductions ($MTCO_2e$) -495.3	2020
Methodology	The Water Conservation Act (SBX 7-7) requires the state to achieve a 20% reduction in urban per capita water use by the year 2020. North Marin Water District (NMWD) exceeded this target in 2010. This measure assumes NMWD will continue to implement the existing conservation programs identified in NNWD's 2010 Urban Water Management Plan. These measures are estimated to save 384 acre feet between 2010 and 2020. 35% of the savings are related to indoor water use and 65% to outdoor water use. 30% of indoor water use is assumed for hot water use. Calculation includes emissions avoided for treating and transporting potable water by NMWD and treating wastewater by the Novato Sanitary District. Electricity consumption for wastewater treatment estimated at 1,911 kWh/MG. Electricity consumption for water treatment and delivery estimated at 3,500 NMWD service area population is projected to be 64,804 in 2020.
Sources	North Marin Water District, 2010 Urban Water Management Plan. City of Novato, General Plan 2035 White Paper, Water Availability and Conservation, June 2014. EBMUD Indoor Water Conservation Study (p. 31), 2003, http://www.ebmud.com/sites/default/files/pdfs/residential-indoor-wc-study.pdf. ICLEI Climate and Air Pollution Planning Assistant - CAPPA V1.5 Personal communication with Dan Carney, Water Conservation Manager, MMWD. "Refining Estimates of Water-Related Energy Use in California," CEC, December 2006.

Calculation

Indoor Water	**2020**
Water consumption reduction in NMWD service area	125,126,949 gallons
Water consumption reduction in Novato city limits	102,721,339 gallons
Water-related electricity saved	359,554 kWh
Wastewater-related electricity saved	68,705 kWh
Indoor hot water consumption reduction	10,785,741 gallons
Natural gas required to heat one gallon of water	0.0098 therms
Electricity required to heat one gallon of water	0.19 kWh
Percent water heaters that use natural gas	58%
Therms saved	61,306 therms
Electricity saved	860,702 kWh
GHG emissions reduction	495.3 $MTCO_2e$

MUNICIPAL WATER USE

Reduction Measure 12

Objective	Implement programs to reduce the use of potable water in municipal facilities.
Reductions ($MTCO_2e$) -0.4	2020
Methodology	2014 Green Business Certification Report identified water savings of 86,500-121,500 gallons per year through installation of high-efficiency toilets and sink faucet aerators at Police Department. Additional savings assumed for measures as identified in the CAP.
Sources	Novato Climate Action Plan 2009 City of Novato Green Business Certification Report, 2014

Calculation

	2020
Average water savings of Police Dept upgrade	104,000 gallons
Electricity savings for treating and transporting water	364 kWh
Electricity for municipal water use for sprinklers, irrigation and pumps	134,169 kWh
Annual decrease in electricity use with 1.8% reduction	2,415 kWh
GHG emissions reduction	0.37 $MTCO_2e$

VEHICLE IDLING

Reduction Measure 13

Objective	Improve traffic flow and reduce VMT within the City.
Program Description	Singal synchronization project has already been completed. Additional program action is to implement vehicle idling limitations for commercial and construction vehicles annd buses beyond State law.
Reductions ($MTCO_2e$) -1,601.6	2020
Methodology	The City of Novato received a grant from the Metropolitan Transportation Commision Progrm for ArterialSsystem Synchronization (PASS) to conduct a signal timing study and develop optimized timing plans for 35 intersections along 7 roadway corridors within the City of Novato. The study intersections are located along 7 major corridors and included: 1) San Marin Drive; 2) Diablo/De Long Avenue; 3) Rowland Boulevard; 4) Ignacio/Bel Marin Key Boulevard; 5) Redwood Boulevard; 6) Novato Boulevard; and 7) Nave Drive. These study corridors also serve as vital link for regional transit services from Golden Gate Transit and Marin County Transit. Currently the study corridors serve six (6) Golden Gate Transit routes with average weekday ridership that varies between 275-1,950 passengers. Marin County Transit currently operates three (3) routes along the project corridors. The project was completed in 2013. The project estimated fuel consumption savings of 116,257 gallons. Fuel consumption is broken down between deisel and gasoline by using EMFAC 2011 estimates for annual deisel and gasoline consumption for the year See Novato Climate Change Action Plan 2009 for heavy-duty truck vehicle idling methodology.
Sources	City of Novato Pulbic Works Department, "Novato Signal Timing Project: Program for Arterial System Synchronization (PASS) FY 12/13 Cycle" fact sheet Novato Climate Change Action Plan 2009

Calculation

	2020
Signal Synchronization	
Fuel consumption savings from 2013 Signal Timing Project	116,257
% gasoline	88.4%
% deisel	11.6%
GHG emissions reduction from signal synchronization	1,040
Heavy Duty Truck Idling	
Heavy-duty truck population targeted	250
Hours per year truck idling	60,000
Decrease in diesel consumption (gallons)	55,000
Equivalent VMT reduction	5,987,738
GHG emissions reductions from heavy trucks	562
Total GHG emissions reductions	1,602

TRIP REDUCTION

Reduction Measure 14

Objective	Facilitate programs aimed at reducing vehicle trips. 1) Work with Rideshare 511 and major employers to create ride-share programs, preferential parking, and shuttle services to public transit connections; and 2) Facilitate development of a City-wide car-share program.
Program Description from 2009 CCAP	1) Work with Rideshare 511 and major employers to create ride-share programs, preferential parking, and shuttle services to public transit connections; and 2) Facilitate development of a City-wide car-share program.
Reductions ($MTCO_2e$) -697.7	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Total employment	22,710
Annual VMT reduced per rideshare participant	211
Rate of participation in Rideshare programs	12%
Annual VMT reduced per Car Share participant	3,000
Participants in Car Share programs (2%)	454
Annual decrease in VMT	1,937,617
GHG emissions reductions	698

LOW EMISSION VEHICLE INFRASTRUCTURE

Reduction Measure 15

Objective	Improve infrastructure for low emission vehicles.
Program Description from 2009 CCAP	a. Low Emission Vehicle Infrastructure: Work with the Transportation Authority of Marin and Marin Climate and Energy Partnership to develop infrastructure and facilities for low emission vehicles, including extended-range electric vehicles (EREV), plug-in hybrid electric vehicles (PHEVs) and all-battery electric vehicles (BEVs). b. Low Emission Vehicle Facilities: Require new/modified commercial and civic developments to provide charging facilities for low emissions vehicles (Level 3, Hi Power) when appropriate. c. Electric Vehicle Adoption Campaign: Support a local Electric Vehicle adoption campaign.
Reductions ($MTCO_2e$) -405.2	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Number of charging spaces	300
Average annual vehicle miles per space	4,704
Annual VMT for low emission vehicles	1,411,200
Annual emissions ($MTCO_2e$)	508
Annual electricity use (kWh)	783,216
Annual electricity emissions	103
GHG emissions reductions	405

CITY LOW EMISSION VEHICLES

Reduction Measure 16

Objective	Increase the use of alternative fuel vehicles to reduce vehicle GHG emissions.
Program Description	a. Vehicle Fleet: Convert the City's vehicle fleet to hybrid, electric, and alternative fuel vehicles. Replace 15 vehicles with hybrid vehicles and 5 with EVs by 2020. b. Clean Diesel: Continued installation of diesel oxidation catalysts on the diesel powered vehicles and equipment as required by State law.
Reductions ($MTCO_2e$) -246.0	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Number of vehicles replaced with hybrids	15
Number of vehicles replaced with EVs	5
Miles per gallon of vehicle replaced	14
Miles per gallon of replacement hybrid	25
Miles per gallon of replacement EV	n/a
Average annual miles per hybrid	3,266
Average annual miles per EV	117
Annual gasoline savings (gallons)	28,018
Annual electricity use by EVs (kWh)	463
Annual electricity emissions	0.1
GHG emissions reductions	246

MIXED USE, INFILL DEVELOPMENT

Reduction Measure 17

Objective	Require mixed-use, infill development at higher densities to ensure providing a mix of housing, employment and commercial services within the community.
Program Description from the 2009 CCAP	a. Public Outreach: Educate the public about the benefits of well-designed, higher density development. b. Land Use Mix: Reevaluate land use types and mixes to ensure residents' needs are met within the City. c. Neighborhood Serving Commercial Services: Provide for neighborhood-serving commercial services within 3-miles of all residential uses. d. Jobs-Housing Balance: Reevaluate land uses and obstacles to development to encourage a balance of jobs to housing. f. Mixed-Use, High Density and Infill Development: Encourage the development of mixed-use, high density, infill development near transit and amenities. g. Detached Single-Family Residences: Continue to support the Urban Growth Boundary by reducing the number of single-lot/single-family detached residences.
Reductions ($MTCO_2e$) -211.5	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Percentage decrease in VMT per 100% increase in density	5%
Percentage increase density from 2010	4%
Percentage decrease in VMT (citywide)	0.21%
Total VMT (2010 baseline)	267,073,786
Annual decrease in VMT due to increased density	571,040
VMT from new development	1,015,083
VMT attributed to shopping and commuting	324,827
Percentage decrease in VMT for convenience to shopping and jobs	5%
Annual decrease in VMT for mixed-use and jobs-housing balance	16,241
Total VMT reduction for increase density and convenience to services	587,282
GHG emissions reductions	211

JOBS/HOUSING BALANCE

Reduction Measure 18

Objective	Attract a variety of employment opportunities, including higher paying jobs, for those who live, or are likely to live, in the community.
Reductions ($MTCO_2e$) -1,786.3	2020
Methodology	See Novato Climate Change Action Plan 2009. Measure was originally developed with the objective of achieving an ideal ratio of 1.5 jobs per household. Novato 2010 jobs/households ratio was 1.03. Achieving a ratio of 1.5 would require an increase of more than 10,000 jobs by 2020, a number that was determined to not be feasible. As a result, the program was revised to reflect projected jobs increase through development of North, North Redwood area, in addition to the job growth projected by ABAG. The North, North Redwood Boulevard Corridor Study White Paper (August 2014) projects 669,365 square feet of additional office/R&D space in the area. Assuming 285 square feet per office employee (Novato Existing Conditions Report, April 2014), the additional office space is expected to attract 2,348 higher paying jobs by 2035. 25% of this number was assumed for 2020. As of September 2014, the Life Science campaign had increased the number of Life Science industry jobs in Novato by 188 (Chris Stewart, City of Novato Economic Development Director).
Sources	Novato Climate Change Action Plan 2009. Equation to calculate projected emission reductions was revised to reflect lower projected jobs/housing ratio.

Calculation

	2020
Households	20,679
Employment	22,710
Increase in office workers projected in North, North Redwood Study	587
Projected jobs/housing ratio	1.13
Percentage decrease in VMT	1.86%
Annual decrease in VMT	4,960,969
GHG emissions reductions	1,786

AFFORDABLE HOUSING

Reduction Measure 19

Objective	Continue support of affordable housing ordinance and programs.
Reductions ($MTCO_2e$) -7.4	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
New households	400
% units that are BMR	10%
BMR units	40
Percentage decrease in VMT per unit	4.0%
Annual decrease in VMT	20,664
GHG emissions reductions	7

PEDESTRIAN CONNECTIONS

Reduction Measure 20

Objective	Promote walking through design standards and amenities that concentrate uses, reduce the need to vehicular travel, and enhance the pedestrian experience.
Program Description from the 2009 CCAP	a. Ensure that applications for new office and mixed-use development analyze the project's connection and orientation to pedestrian paths, bicycle paths, and existing transit stops within 1/2 mile of the project site. Project must be oriented towards existing transit, bicycle, or pedestrian corridor with minimum setbacks. b. Require applications for new office and mixed-use development in downtown areas to minimize setbacks from the street and provide pedestrian pathways. Primary entrances shall be located on street frontage, with parking lot designed to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances. c. Encourage pedestrian oriented plazas, walkways, bike trails, bike lanes and street furniture within the Civic Center area and connections to other community areas. d Pedestrian Convenience: Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage.
Reductions ($MTCO_2e$) -12.8	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
VMT from new development	1,015,083
Percentage decrease in VMT	3.5%
Annual decrease in VMT	35,528
GHG emissions reductions	13

COMMERCIAL BICYCLE PARKING

Reduction Measure 21

Objective	Increase bicycle parking requirements for new and significantly retrofitted non-residential projects to a minimum rate of 1:20 vehicle spaces. Bicycle parking shall be divided between short-term facilities (bike racks) and long-term facilities (bike lockers or other covered facility). Continue implementing requirements for showers, lockers, and changing space in all large non-residential facilities.
Reductions ($MTCO_2e$) -0.9	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
VMT from new development	1,015,083
Percentage attributed to commercial businesses	41.5%
VMT attributed to new commercial businesses	421,260
Percentage decrease in VMT	0.625%
Annual decrease in VMT	2,633
GHG emissions reductions	1

RESIDENTIAL BICYCLE PARKING

Reduction Measure 22

Objective	Increase bicycle parking requirements for new multi-family residential construction. Short-term facilities shall be provided at a minimum rate equal to 10% of vehicle spaces. Long-term facilities shall be provided at a ratio of one long-term bicycle parking space for every unit. Long-term facilities shall consist of one of the following: a bicycle locker, a locked room with standard racks and access limited to bicyclists only, a standard rack in a location that is protected from the elements and monitored by video surveillance 24 hours per day or designated space within the unit's garage/carport.
Reductions ($MTCO_2e$) -0.6	2020
Methodology	See Novato Climate Change Action Plan 2009
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
VMT from new development	1,015,083
Percentage attributed to residential development	43.5%
VMT from new residential development	441,561
Percentage attributed to multifamily development	60%
VMT attributed to new multifamily development	263,873
Percentage decrease in VMT	0.625%
Annual decrease in VMT	1,649
GHG emissions reductions	1

COMPLETE STREETS

Reduction Measure 23

Objective	Adopt "Complete Street" standards to facilitate multi-modal access for those trips that cannot be completed by walking alone.
Program Descrption from 2009 CCAP	a. Pedestrian and Bicycle Design Standards: Develop and implement comprehensive pedestrian and bicycle design standards that require streets to provide for safe and convenient system of bicycle routes and pedestrian ways, including sidewalks, walking paths or other connections, with safety amenities such as lighting and signage. b. Bicycle Infrastructure and Facilities: Expand bicycle infrastructure and facilities, such as bicycle stoplight sensors, bicycle lanes and paths, etc. c. North/South Bicycle Path: Develop a North/South bicycle path through the City.
Reductions ($MTCO_2e$) -59.7	2020
Methodology	See Novato Climate Change Action Plan 2009. Calculation methodology was not clear. As an alternative, the following methodology was used: According to the 2001 National Household Travel Survey, average annual VMT per household is 21,187 and the "to or from work" sub-category is 5,724 (27.0%). Current bike commuting VMT was estimated at 1% of VMT attributed to commuting.
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Miles of new Class I bike lanes	0.985
Miles of new Class II bike lanes	2.990
Miles of new Class III bike lanes	1.675
Total miles new bike lanes	5.650
City population	53,200
Total VMT	267,073,786
Percentage attributed to commuting	27%
VMT attributed to commuting	72,109,922
Current percentage of bike commuters	1%
Estimated bike commuting VMT	721,099
Percentage increase in bike commuting	23%
Annual decrease in VMT	165,853
GHG emissions reductions	60

PARKING STANDARDS

Reduction Measure 24

Objective	Revise parking standards to disincentivize single-occupant vehicles and promote non-vehicular travel for developments in commercial, multi-unit residential, or mixed-use developments near transit. Account for design elements that promote non-vehicular travel such as proximity to transit, proximity to employment centers, bicycle facilities, and location near transit.
Program Description from 2009 CCAP	a. Special review of parking is required to allow a project to build less than the typically mandated amount of parking if the development features design elements that reduce the need for automobile use. b. Parking Management Program: Develop a comprehensive Parking Management Program that includes parking fees and design elements promoting non-vehicular travel, such as thru reduced on-site parking requirements, adjusted parking pricing, and shared parking facilities. c. Preferential Parking: Provide preferential parking in public and private developments for alternative-fuel vehicles, carpools and vanpools, etc.
Reductions ($MTCO_2e$) -22.9	2020
Methodology	See Novato Climate Change Action Plan 2009.
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Local road VMT	167,104,323
VMT attributed to new development	635,123
Percentage decrease in VMT	10%
Annual decrease in VMT	63,512
GHG emissions reductions	23

TRANSIT IMPROVEMENTS

Reduction Measure 25

Objective	Work with transit providers to plan, fund and implement additional transit services that are cost-effective and responsive to existing and future transit demand.
Program Description from 2009 CCAP	a. School Bus Service: Work with the Novato Unified School District to restore or expand school bus service. b. Expand efforts to work with transit providers to include Sonoma transit and any shuttles that are currently being used between Sonoma and Marin. c. Public Transit Incentives: Provide public transit incentives such as free or low-cost monthly transit passes. d. Shuttle Service: Work with large employers to provide shuttle service to public transit. e. Improve Security: Improve lighting and other security measures near public transit and park-and- rides. f. SMART Stations: Maximize use of MTC grants to plan for SMART stations. g. Downtown SMART Whistle Stop: Include a downtown SMART Whistle-Stop (request stop) at the existing station. h. Park and Rides: Evaluate the need for additional Park & Ride lots.
Reductions ($MTCO_2e$) -284.0	2020
Methodology	In 2011, Marin Transit, in partnership with the City of Novato, conducted a Novato Transit Needs Assessment. A number of the phase 1 recommendations from the study were implemented in March 2012. These changes increased local frequencies to every 30 minutes, increased span of service for early morning and late night trail, and added weekend service to areas previously un-served. Transit routes that traversed Novato in 2010 included Marin Transit Routes 49, 51, 52 and 71, Golden Gate Routes 54, 56, 58, 70, 80, and 101 and the Novato Dial-A-Ride program. Transit ridership is based on the following annual ridership statistics from the Marin Transit System Performance Summary for Fiscal Year 2010/11: Route #49, San Rafael-Ignacio, 159,065 passengers; Route #51 - 95,260 passengers; Route #52, Novato-San Rafael, 120,454 passengers; #71, Highway 101 Corridor, 326,815 passengers; Novato Dial-A-Ride, 5,720 passengers. Total: 707,314 passengers. Average passenger trips for Route #51 and Novato Dial-A-Ride are estimated at 3 miles, based on Google Map modeling (2.6 miles from San Marin High School to Downton Novato) Average passenger trips for Routes #49, 52 and 71 are estimated by taking one half of the route length as follows: Route #49 - 6.7 miles; Route 52 - 5.7 miles; Route 71 - 9.8 miles. For every 1.0% increase in transit service (measured by transit vehicle mileage or operating hours), ridership increases 0.5% (Victoria Transportation Policy Institute, http://vtpi.org/tdm/tdm47.htm

TRANSIT IMPROVEMENTS (con't.)

Reduction Measure 25

Sources	Novato Climate Change Action Plan 2009 Marin Transit System Performance Summary for Fiscal Year 2010/11 and Fiscal Year 2012/13, http://www.marintransit.org/monitoringreportsarchive.html www.google.com/maps

Calculation

	2020
Transit ridership, 2010, for Marin Transit routes traversing Novato	707,314
Miles per passenger, weighted average	7.4
Percentage increase in frequency of bus travel (%)	30
Annual increase in transit ridership with increased frequency and/or routes	106,097
Annual decrease in VMT	788,708
GHG emissions reductions	284

SAFE ROUTES TO SCHOOL

Reduction Measure 26

Objective	Collaborate with the Transportation Authority of Marin to expand Safe Routes to School Programs, including a walking school bus program to provide a supervised, safe, and timely commuting alternative for children.
Program Description form 2009 CCAP	To actively promote walking as a safe mode of local travel, particularly for children attending local schools by employing traffic calming methods such as median landscaping and provision of bike or transit lanes to slow traffic, improving roadway capacity, and addressing safety issues.
Reductions ($MTCO_2e$) -2.1	2020
Methodology	See Novato Climate Change Action Plan 2009.
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Number of students	9,931
Estimated VMT for student commute	39,724
Annual decrease in VMT	5,959
GHG emissions reductions	2

MUNICIPAL TRAVEL

Reduction Measure 27

Objective	Encourage employees to utilize alternative forms of transportation for commutes and work-related trips.
Program Description from 2009 CCAP	a. Trip Reduction Incentive Program (TRIP): Establish an incentive program for employees who voluntarily participate in alternative forms of transportation to and from work, including parking cash-out, or who participate by telecommuting and/or alternative work schedules, as appropriate. b. .Bicycle Fleet: Provide fleet bicycles and encourage their use for short trips to meetings or site visits.
Reductions ($MTCO_2e$) -101.4	2020
Methodology	See Novato Climate Change Action Plan 2009.
Sources	Novato Climate Change Action Plan 2009

Calculation

	2020
Employees	213
Employee travel	1,408,599
Participation rate	20%
Number of participants	43
Annual decrease in VMT	281,720
GHG emissions reductions	101

ZERO WASTE

Reduction Measure 28

Related General Plan Programs	Achieve Zero Waste diversion goals as formalized in the franchise agreement between Novato Sanitary District and Novato Disposal Service.
Program Description form 2009 CCAP	a. Construction and Demolition Ordinance: Adopt a more stringent Construction and Demolition Ordinance that mandates a reported 60% diversion (current standard is 50%). b. Composting and Recycling: Require the City's next solid waste service agreement to include organic waste composting and expanded green waste and recycling options for business and residents, if feasible. c. Restaurant Food Waste Collection: Work with the Novato Sanitary District to implement a restaurant food waste collection program. d. E-Waste: Provide e-waste recycling drop-off bins at City facilities. e. Recycling Containers in Public Areas: Provide interior and exterior storage areas for recyclables and green waste, and adequate recycling containers in public areas, including parks and community centers. f. Mandatory Recycling at Special Events: Require recycling at City-sponsored and other public events. Evaluate zero waste or recycling requirements for all special events at City facilities and/or all special events that require a City permit or authorization. g. Organic Material Recovery Program: Work with the Novato Sanitary District to establish an organic material recovery program for green waste for agency parks and facility landscaping. h. Residential Outreach: Develop outreach program to encourage residential participation in green waste and composting programs. i. Non-Residential Outreach: Educate businesses and residents about climate friendly procurement opportunities and opportunities to reduce waste., including discontinuing use of Polystyrene Foam Containers and Disposable Bags. j. Municipal Purchasing and Procurement Programs: Continue to implement and expand sustainable purchasing programs, including the City's Environmentally Preferable Purchasing Program. Provide a preference or incentives to service providers, vendors and contractors who follow climate-friendly practices, such as the use of recycled content materials, Energy Star or equivalent materials and equipment, as well as alternative fuel vehicles.
Reductions ($MTCO_2e$) -2,522.9	Implementation action: 2020: Divert 70% of waste from landfill.
Methodology	The Novato Sanitary District has zero waste goals incorported in its franchise agreement with Novato Disposal as folows: 60% diversion by 2015, 70% diversion by 2020, and 80% diversion by 2025. Diversion rates were 56% in 2010 and 58% in 2013 (most recent year data available). Calculation assumes organic waste will be diverted at the same rate as all other waste.
Sources	Personal communication with Dee Johnson, HHW & Outreach Coordinator, Novato Sanitary District, palomadee@gmailcom, 510-530-6048

ZERO WASTE (con't.)

Reduction Measure 28

Calculation

	2020
Waste emissions BAU	7,929.2 $MTCO_2e$
Percent waste diverted from landfill in 2010	56 %
Percent waste diverted from landfill	70 %
Tons of waste diverted from landfill	13,352 tons
GHG emissions reduction	2,522.9 $MTCO_2e$

APPENDIX B

2012 California Environmental Quality Act (CEQA) Statute and Guidelines

§15183.5. TIERING AND STREAMLINING THE ANALYSIS OF GREENHOUSE GAS EMISSIONS

(a) Lead agencies may analyze and mitigate the significant effects of greenhouse gas emissions at a programmatic level, such as in a general plan, a long range development plan, or a separate plan to reduce greenhouse gas emissions. Later project-specific environmental documents may tier from and/or incorporate by reference that existing programmatic review. Project-specific environmental documents may rely on an EIR containing a programmatic analysis of greenhouse gas emissions as provided in section 15152 (tiering), 15167 (staged EIRs) 15168 (program EIRs), 15175–15179.5 (Master EIRs), 15182 (EIRs Prepared for Specific Plans), and 15183 (EIRs Prepared for General Plans, Community Plans, or Zoning).

(b) Plans for the Reduction of Greenhouse Gas Emissions. Public agencies may choose to analyze and mitigate significant greenhouse gas emissions in a plan for the reduction of greenhouse gas emissions or similar document. A plan to reduce greenhouse gas emissions may be used in a cumulative impacts analysis as set forth below. Pursuant to sections 15064(h)(3) and 15130(d),
a lead agency may determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project complies with the requirements in a previously adopted plan or mitigation program under specified circumstances.

(1) Plan Elements. A plan for the reduction of greenhouse gas emissions should:

(A) Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area;

(B) Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable;

(C) Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area;

(D) Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;

(E) Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specified levels;

(F) Be adopted in a public process following environmental review.

(2) Use with Later Activities. A plan for the reduction of greenhouse gas emissions, once adopted following certification of an EIR or adoption of an environmental document, may be used in the cumulative impacts analysis of later projects. An environmental document that relies on a greenhouse gas reduction plan for a cumulative impacts analysis must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. If there is substantial evidence that the effects of a particular project may be cumulatively considerable, notwithstanding the project's compliance with the specified

requirements in the plan for the reduction of greenhouse gas emissions, an EIR must be prepared for the project.

(c) Special Situations. As provided in Public Resources Code sections 21155.2 and 21159.28, environmental documents for certain residential and mixed use projects, and transit priority projects, as defined in section 21155, that are consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in an applicable sustainable communities strategy or alternative planning strategy need not analyze global warming impacts resulting from cars and light duty trucks. A lead agency should consider whether such projects may result in greenhouse gas emissions resulting from other sources, however, consistent with these Guidelines.